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Walter Reed Army Medical Center Direct Patient Care in Support
of the Global War on Terrorism Inpatient Casualties

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Abstract

Walter Reed Army Medical Center (WRAMC) is the premier medical specialty referral center in the United States Department of Defense (DOD) and is the leading institution for clinical education and research in the U.S. Army (Walter Reed Web Page). WRAMC plays a crucial role in the DOD's patient evacuation system as the first continental United States (CONUS)-based military medical treatment facility to receive soldiers evacuated from European Command (EUCOM) and Central Command (CENTCOM) areas of responsibilities (AORs). Since fall of 2001, WRAMC has received soldiers injured in support of both Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF), the two primary operations in the United States Global War on Terrorism (GWOT).

This study was designed to review the composition of initial GWOT inpatient casualties received at WRAMC and to explore the costs associated with the care provided. These results will assist planners in understanding appropriate levels of resources needed to support future contingency operations.

Cross-sectional data on primary diagnosis-related group (DRG) and DRG "cost" were collected for 372 GWOT inpatients admitted to WRAMC in FY03.

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Introduction

Walter Reed Army Medical Center Direct Patient Care Resource Expenditures in Support of the Global War on Terrorism Inpatient Casualties

Overview of Water Reed Army Medical Center Operations

Walter Reed Army Medical Center (WRAMC) is the premier medical specialty referral center for the United States Department of Defense (DOD) and is the leading institution for clinical education and research in the U.S. Army (Walter Reed Web Page). WRAMC plays a crucial role in DOD's patient evacuation system as the first continental United States (CONUS)-based military medical treatment facility to receive wounded soldiers evacuated from European Command (EUCOM) and Central Command (CENTCOM) areas. Since fall of 2001, WRAMC has received soldiers injured in support of both Operation Enduring Freedom (OEF) in Afghanistan and Operation Iraqi Freedom (OIF), the two primary operations in the United States Global War on Terrorism (GWOT).

As of 1 April 2004, WRAMC had treated and discharged nearly 900 OEF/OIF inpatients for various battle injuries (BI), as well as diseases and non-battle injuries (DNBI) acquired while supporting these operations. In addition, over 2,000 GWOT casualties have received medical care at WRAMC on an outpatient

basis. Caring for GWOT casualties became the single greatest defining event for the Walter Reed leadership in 2003 and 2004, requiring over \$40 million in unfunded costs and substantial organizational adjustments.

Conditions that prompted the study

The United States Office of Management and Budget (OMB) Emergency Response Funding reimbursed Walter Reed through the North Atlantic Regional Medical Command (NARMC) and the U.S. Army Medical Command (MEDCOM) during FY 2003 for direct patient care costs incurred in support of GWOT operations. The United States Government Accounting Office (GAO) published an April 2003 report entitled *Tracking of Emergency Response Funds for the War on Terrorism* that identified issues with properly tracking of GWOT funding, indicating a need for continued financial vigilance in requesting GWOT reimbursement (GAO, 2003). Greater accuracy in WRAMC's accounting for GWOT inpatient costs will assist OMB to allocate emergency funding among other federal agencies. Mitchell Daniels, Director of the White House OMB urged that it was "incumbent...to see that every dollar of these resources...is fully accounted for" in his Memorandum M-01-31 on 14 September 2001 (OMB, 2001, p. 1). In August of 2002, he further asked for agencies to "review and validate" GWOT activities to use for future performance measures to determine

funding levels for fighting terrorism outside of the United States (OMB, 2002, p. 1).

In January 2004, MEDCOM subsequently developed guidance on the financial management of GWOT funding provided by OMB, reiterating the need for tight financial accounting of GWOT expenditures (United States Army MEDCOM, 2004). This guideline identified OIF and OEF so that MEDCOM units could better determine what GWOT support activities were eligible for reimbursement, but reminded commanders that, "mission support will not be hindered by lack of funding at any level" and that, "GWOT funding will be constrained" (United States Army MEDCOM, 2004, p. 2).

At the start of this study, WRAMC had projected over \$10 million in overall GWOT inpatient direct care costs for FY2003. This cost was calculated after the patient discharge, using standard medical costing automated information system, called Encoder Grouper (American Management Systems, Inc., 2004). The average inpatient cost was applied to the *current* inpatients (who had not yet been coded) to estimate their projected cost. The average inpatient cost provided only a general indication of the cost of providing inpatient care and the leadership expressed an interest in gaining further insight into those costs.

Statement of the Problem

The substantial increase in resources expended during FY03 in support of GWOT operations created significant financial challenges for Walter Reed. This study was designed to review the demographic composition of initial GWOT inpatient casualties received at WRAMC and to explore the costs associated with the care provided. More detailed understanding of the demographic composition of the GWOT inpatients will assist in continued support of GWOT and more effective planning for WRAMC's support of future contingency operations.

Literature Review

The former Surgeon General of the Israeli Defense Forces, retired Brigadier General Eran Dolev, identified several factors that helped hospitals deal with casualties resulting from terrorist activities. He stated that explosions are becoming more prevalent causing an increased number of trauma injuries (Dolev 1990). Dr. Dolev also recommended that hospitals create and test emergency plans including flexibility to reallocate departmental resources to meet the most compelling medical needs (Dolev 1990). According to Dolev (1990) the Israeli's introduction of the concept of evacuation hospitals in 1972 to act as *triage centers*, allowed other facilities to focus their medical resources on "highly specialized treatment" (Dolev 1990, p. 58). This concept allowed over 4,000 trauma casualties of the 1973 October War to be more effectively managed.

Landstuhl Regional Medical Center (LRMC), located in southern Germany, was the focus of *highly specialized treatment* for the influx of casualties during Operation Enduring Freedom, while U.S. military medical resources in Afghanistan provided the triage center function to stabilize the patients prior to evacuation to LRMC. In response to the initial casualties, LRMC developed a Deployed Warrior Medical Management Center (DWMMC) to make "most efficient use of the Landstuhl staff," (Gillespie, Johnson & Frazier 2002, p. 27) and to better meet the unique needs of soldiers evacuated from OEF.

WRAMC also took steps to better coordinate incoming casualties. On 20 March 2003, they established "comprehensive services to casualties," recognizing that "quality family and community reunion process" was essential in the speedy recovery of soldiers evacuated to their facility (WRAMC Regulation 40-34, 2003, p. 1).

LRMC's Colonel James Rundell and Major Damon Baine (2002) identified the need for accurate information to anticipate the resources required for medical support of military operations. Their study of the initial wave of patients evacuated to LRMC from Operation Enduring Freedom (OEF) showed an increased number of orthopedic and trauma injuries as a result of the nature of the war on terrorism. They noted that 88% of all OEF casualties were classified as disease and non-battle injuries (DNBI),

incorporating accidents and other diseases and injuries not a result of direct combat. The remaining 12% of OEF casualties they received had battle injuries sustained in the theater of operation. They also observed a substantial difference in the medical needs of males and female soldiers evacuated from OEF, noting that 84% of the casualties seen were male. The gender disparity was also seen in the number of males receiving blast injuries (11%) compared with females (1%), a statistically significant difference ($p=0.0008$) (Rundell & Baine, 2002).

Rundell and Baine (2002) further reported that the majority of overall patients treated at LRMC had a primary diagnosis requiring surgery of some kind. As many as 61% of the soldiers required general surgery, orthopedic or other surgical services as their most urgent medical need. Twenty-three percent required treatment from Department of Medicine, while nine percent were treated in Psychiatry, four percent in Ophthalmology and three percent in Obstetrics and Gynecology.

Rundell and Baine (2002) reported a less-than-seven day average length of stay for OEF patients seen at LRMC, at least one day less than the US Department of Justice (DOJ) reported for victims of violent crimes in America from 1992-1998. According to the DOJ, only 21% of victims of violent crimes, with many injuries closely related to combat-related trauma,

were admitted to the hospital for 8 days or longer (Simon, 2000) .

Because of the unique medical needs of wartime casualties, it is understandable that a greater outlay of resources is required to coordinate care (Gillespie, 2002) . Hospitals are challenged with not only organizing the necessary services to meet the medical need, they are also required to perform a number of extraordinary measures to address the unique aspect of the care and treatment of wartime patients (Gillespie, 2002) .

In order to determine what method of calculation was most accurate in accounting for inpatient trauma patients, Brooke Army Medical Center (BAMC), in San Antonio, Texas conducted a cost study in FY2000 to determine if their inpatient reimbursement system was sufficiently capturing the actual expenses incurred. As a result, the study predicted inpatient costs with a model that used financial data combined from several existing systems. The predictive model results were then compared with the actual cost data for the same group. They determined that there was no significant difference between their internally developed model and their existing method of calculating costs. BAMC observed that attempting to thoroughly account for inpatient costs was difficult and that their financial information accounting systems were not suited to tracking cost on a per-encounter method. Of the 60-patient

sample size from a population of 505 civilian trauma cases, the mean length of stay was 8.4 days. The BAMC study also recognized that the follow-on treatment of trauma cases benefited their facility in four areas: readiness, Graduate Medical Education (GME), staff utilization and community relations (DHPM Data Analysis Branch, 1999).

Purpose

The purpose of this research is to review and describe the demographic composition of GWOT inpatient casualties received at WRAMC and to explore inpatient treatment.

Objectives

The primary objective of the study was to conduct a descriptive analysis of GWOT inpatients to describe differences in gender, Armed Services component, patient category (disease, battle injury or non-battle injury), major clinical need, and other relevant data. The secondary objective of the study was to explore average costs associated with the treatment of inpatient GWOT casualties.

Methods and Procedures

Sources of Data

The primary source of data for this study was WRAMC inpatient cost data for GWOT casualties (372 inpatients treated and discharged as of 1 October 2003). The information analyzed was contained in the WRAMC GWOT database, a locally produced

web-based database maintained by the Patient Administration Division (PAD) and verified by selected personnel. The database was initially populated by information from DOD's Transportation Command Regulating and Command and Control Evacuation System (TRAC2ES), a web-based patient-tracking database. In most cases, the patients were evacuated to WRAMC from Landstuhl Regional Medical Center (LRMC) in Germany. Upon arrival, WRAMC PAD technicians verify the information contained in TRAC2ES and transfer the information to the GWOT database. The PAD technicians also update the information to indicate any changes in medical condition that may have transpired in flight. The database is also reviewed periodically by members of the Walter Reed command staff and by the NARMC commander. For the secondary objective, the study used patient cost information derived from DRGs. Some patients did not have cost data due to delays in processing and coding their inpatient encounter. Those patients without cost data were not included in the average cost.

The current procedure for projecting inpatient GWOT costs has been an accepted practice by WRAMC, NARMC and MEDCOM. As of 10 September 2003 the total amount of coded charges for 344 discharged patients equaled \$7.5 million with an average charge per patient of \$21,928. The total number of patients included in this study with available cost data was 280. These patients

were used to compute average costs and standard deviation for gender, rank, patient category and primary referral.

Sampling procedures and means of data gathering

This study identified demographic information on 372 United States service members treated on an inpatient basis at WRAMC during FY03. Each service member's service component, patient category, gender, rank, average length of stay, average age, primary referral and average DRG cost was calculated and reported.

Validity and reliability

The data in the GWOT database have face validity since several different levels of administrative staff and leadership verify the information as it is received. Walter Reed uses this database as the primary source for clinical and demographic information concerning GWOT casualties received. The primary DRG codes were used to determine associated costs. The Code of Federal Regulation 199.7, entitled *Claims Submission, Review and Receipt*, establishes a basis for verification of clinical procedures performed in a military treatment facility. This method involved an accepted healthcare industry formula and is commonly referred to as inpatient DRG (Escobar & Ojeda, Coventry, 1996). Following an inpatient discharge, the patient is assigned a primary DRG, which is used to request financial

reimbursement from OMB based on the regional cost associated with that DRG.

Ethical considerations

All published results had unique patient information removed to eliminate possible identification. In addition, the nature and extent of soldier injuries in this study were discussed in broad terms and general categories.

Results

The overall population data set consists of clinical and administrative data from the records of 372 U.S. Army soldiers evacuated from OIF/OEF to WRAMC for medical treatment. All soldiers were admitted and discharged from WRAMC between 1 October 2002 and 1 October 2003. The U.S. Army inpatient casualties consisted of 242 (65.05%) soldiers from Active Duty units (AD Army), 48 (12.90%) soldiers from the U.S. Army Reserve (USAR) and 52 (13.98%) Army National Guard (ARNG). The database also consisted of five (1.34%) Active duty Marines (USMC) and seven (1.88%) Active Duty Navy (USN). In addition there were ten (2.69%) Active Duty Air Force (ADAF) and two (0.54%) airmen from the Air National Guard (AFNG). Six (1.61%) inpatients were categorized as "others" and consisted of contractors working for various organizations in support of GWOT (see Table 1 and Figure 3). This is slightly different from LRMC's 48% AD Army, 38% ADAF, 3% USMC and 3% USN. They also reported 2% as "CIV", 2% as

"Allied" and 4% as "Host Nation" (Rundell & Baine, 2002). The difference in results is likely because of a higher percent of AD Army seen at LRMC that required further evacuation to a CONUS-based medical facility and a higher number of AD Air Force that were returned to duty following their treatment at LRMC. The presence of National Guard and Reserve soldiers at WRAMC is a reflection of their greater participation in OIF and not OEF.

Of the 372 total inpatients, 145 (38.98%) of them were Battle Injuries, 131 (35.22%) were Non-Battle Injuries and 96 (25.81%) were categorized as Disease (see Table 1 and Figure 1). The total (inpatient and outpatient) OEF soldiers seen by LRMC initially equaled 638 as of 1 July 2002 with only 12% BI and as many as 88% DNBI (Rundell & Baine, 2002). The significantly higher percent of BI inpatients seen at WRAMC indicates an increase in intensity of guerilla combat, especially in the Iraqi area of operations.

Patient Categories

Battle Injury Casualties

The U.S. Army Active Duty battle injuries evacuated to WRAMC consisted of 118 soldiers (see Table 2), only one (0.85%) of which was female. A total of 16 (13.56%) were officers or warrant officers, while six (5.08%) were senior non-commissioned officers (E-7 and above), 36 (30.51%) were junior non-

commissioned officers (E 5-6) and 60 (50.85%) were junior enlisted (E 1-4).

The average length of stay for Active Duty Army battle injuries evacuated to WRAMC was 18.0 compared with the less than seven-day average of OEF patients seen at LRMC. The average age of the Army AD BI casualties was 26.9 years.

The U.S. Army Reserve (USAR) battle injuries evacuated to WRAMC consisted of nine soldiers, only one of which was female. A total of two (22.22%) were senior non-commissioned officers (E-7 and above), two (22.22%) were junior non-commissioned officers (E 5-6) and five (55.55%) were junior enlisted (E 1-4).

The average length of stay for USAR battle injuries evacuated to WRAMC was 16.8 days. The average age of the USAR BI casualties was 28.4 years.

The Army National Guard (ARNG) battle injuries evacuated to WRAMC consisted of nine soldiers, only one of which was female. One (11.11%) was an officer, while one (11.11%) was a senior non-commissioned officer (E-7 and above), one (11.11%) was a junior non-commissioned officer (E 5-6) and five (55.55%) were junior enlisted (E 1-4).

The average length of stay for ARNG battle injuries evacuated to WRAMC was 19.4. The average age of the ARNG BI casualties was 34.1 years.

The U. S. Marine Corps (USMC) battle injuries evacuated to WRAMC consisted of four male soldiers. One (25.00%) was an officer or warrant officer, while one (25.00%) was a junior non-commissioned officer (E 5-6) and two (50.00%) were junior enlisted (E 1-4).

The average length of stay for USMC battle injuries evacuated to WRAMC was 11.0 days. The average age of the USMC BI casualties was 27.8 years.

The sole U.S. Navy (USN) battle injury evacuated to WRAMC was a male contractor with a two-day length of stay. He was 41 years old.

The Active Duty Air Force battle injuries evacuated to WRAMC consisted of one male junior enlisted soldier (E 1-4). His length of stay was 14 days and his age was 20.

The Air Force National Guard battle injuries evacuated to WRAMC consisted of one male senior non-commissioned officer. His length of stay was one day and his age was 45.

The Other battle injuries evacuated to WRAMC consisted of male civilians with an average length of stay of one day and an average age of 41.5 years.

Disease Casualties

The Active Duty Army diseases injuries evacuated to WRAMC consisted of 47 soldiers, eight (17.02%) of which were female. A total of three (6.38%) were officers or warrant officers, while

six (12.77%) were senior non-commissioned officers (E-7 and above), 12 (25.53%) were junior non-commissioned officers (E 5-6) and 26 (55.32%) were junior enlisted (E 1-4).

The average length of stay for Active Duty Army disease injuries evacuated to WRAMC was 12.7. The average age of the Army AD BI casualties was 29.1 years.

The Army Reserve diseases evacuated to WRAMC consisted of 22 soldiers, four of which were female. A total of one (4.54%) was an officer or warrant officer, while one (4.54%) was a senior non-commissioned officer (E-7 and above), five (22.73%) were junior non-commissioned officers (E 5-6) and 15 (68.18%) were junior enlisted (E 1-4).

The average length of stay for Army Reserve disease injuries evacuated to WRAMC was 13.3. The average age of the Army Reserve BI casualties was 31.1 years.

The Army National Guard diseases injuries evacuated to WRAMC consisted of 18 soldiers, four of which were female. A total of two (11.11%) were officers or warrant officers, while six (33.33%) were junior non-commissioned officers (E 5-6) and 10 (55.56%) were junior enlisted (E 1-4).

The average length of stay for Army National Guard disease injuries evacuated to WRAMC was 6.3 days. The average age of the ARNG D casualties was 35.6 years.

The USN diseases evacuated to WRAMC consisted of four male soldiers, of which one (25.00%) was an officer or warrant officer, while two (50.00%) were junior non-commissioned officers (E 5-6) and one (25.00%) was a junior enlisted man (E 1-4).

The average length of stay for USN disease injuries evacuated to WRAMC was 13.3 days. The average age of the USN D casualties was 33.5 years.

The ADAF diseases injuries evacuated to WRAMC consisted of two male soldiers. One (50.00%) was a senior non-commissioned officer (E-7 and above) and one (50.00%) was a junior enlisted airman (E 1-4).

The average length of stay for USN disease injuries evacuated to WRAMC was 14.0 days. The average age of the ADAF D casualties was 32.5 years.

The Other diseases injuries evacuated to WRAMC consisted of three male civilians.

The average length of stay for USN disease injuries evacuated to WRAMC was 17.0 days. The average age of the Others D casualties was 46.3 years.

Non-Battle Injury Casualties

The Active Duty Army Non-Battle injuries evacuated to WRAMC consisted of 77 soldiers, ten of which were female. A total of eight (10.39%) were officers or warrant officers, while eight

(10.39%) were senior non-commissioned officers (E-7 and above), 28 (36.36%) were junior non-commissioned officers (E 5-6) and 33 (42.86%) were junior enlisted (E 1-4).

The average length of stay for AD Army Non-Battle injuries evacuated to WRAMC was 14.0 days. The average age of the Army AD NBI casualties was 28.8 years.

The USAR Non-Battle injuries evacuated to WRAMC consisted of 17 soldiers, two of which were female. One (5.88%) was a officer or warrant officer, while four (23.52%) were senior non-commissioned officers (E-7 and above), five (29.41%) were junior non-commissioned officers (E 5-6) and seven (41.18%) were junior enlisted (E 1-4).

The average length of stay for USAR NBIs evacuated to WRAMC was 11.4 days. The average age of the USAR NBI casualties was 39.1 years.

The Army National Guard Non-Battle injuries evacuated to WRAMC consisted of 25 soldiers, only two of which were female. One (4.00%) was an officer or warrant officer, while one (4.00%) was a senior non-commissioned officer (E-7 and above), 15 (60.00%) were junior non-commissioned officers (E 5-6) and eight (32.00%) were junior enlisted (E 1-4).

The average length of stay for ARNG NBIs evacuated to WRAMC was 15.2. The average age of the ARNG NBI casualties was 34.9 years.

The one USMC Non-Battle injury evacuated to WRAMC was a male junior enlisted soldier (E 1-4). His length of stay was 3.00 days and his age was 25.0 years.

The U.S. Navy Non-Battle injuries evacuated to WRAMC consisted of two junior enlisted (E 1-4) sailors, one of which was female. Their average length of stay was 18.0. The average age of the Navy NBI casualties was 21.5 years.

The Active Duty Air Force Non-Battle injuries evacuated to WRAMC consisted of seven soldiers, one of which was female. A total of four (57.14%) were junior non-commissioned officers (E 5-6) and three (42.86%) were junior enlisted (E 1-4).

The average length of stay for ADAF NBI evacuated to WRAMC was 15.7 days. The average age of the ADAF NBI casualties was 28.6 years.

The one AFNG Non-Battle injury was a female junior non-commissioned officers (E 5-6). Her length of stay was one day and her age was 36 years. The Other Non-Battle injuries evacuated to WRAMC consisted of one 43-year-old male civilian with an 18.00-day length of stay.

Referrals

Further analysis of the data (see Figure 2) revealed that 108 casualties (29.03%) were referred to Orthopedics (ORTHO) upon arrival at WRAMC, 93 casualties (25.00%) referred to Department of Surgery (SURG), 92 (24.73%) referred to Department

of Medicine (MED), 68 (18.28%) referred to Department of Psychology or Psychiatry (PSYCH), nine (2.42%) were sent to the Ophthalmology (OPHTH) service and two (0.54%) were referred for Obstetrics-Gynecological (OBGYN) treatment. LRMC experienced OEF specialty referrals with some similarities: ORTHO 31%, SURG 30%, MED 23%, PSYCH 9%, OPHTH 4%, OBGYN 3% (Rundell & Baine, 2002). The greater percentage of surgery referrals at LRMC is likely due to the life-saving need for those procedures as well as the requirement for stabilization prior to CONUS evacuation. The higher percentage of Psychology and Psychiatry referrals at WRAMC is likely influenced by the prospect of a longer deployment in Iraq.

Orthopedic Referrals

The overall ORTHO referrals had an average age of 30.59 years and an average length of stay of 17.8 days.

The Active Duty Army ORTHO referrals upon arrival at WRAMC consisted of 72 soldiers, six of which were female (see Table 5). A total of 12 (16.67%) were officers or warrant officers, five (6.94%) were senior non-commissioned officers (E-7 and above), 26 (36.11%) were junior non-commissioned officers (E 5-6) and 28 (40.28%) were junior enlisted (E 1-4).

The Active Duty Army ORTHO referral average age was 28.7 years and their average length of stay was 18.6 days.

The USAR ORTHO referrals upon arrival at WRAMC consisted of 14 soldiers, one of which was female. A total of five (35.71%) was a senior non-commissioned officer (E-7 and above), three (21.43%) were junior non-commissioned officers (E 5-6) and six (42.86%) were junior enlisted (E 1-4).

The USAR ORTHO referral average age was 32.1 years and their average length of stay was 11.3 days.

The ARNG ORTHO referrals upon arrival at WRAMC consisted of 16 soldiers, one of which was female. A total of one (6.25%) was an officer or warrant officer, one (6.25%) was a senior non-commissioned officer (E-7 and above), nine (56.25%) were junior non-commissioned officers (E 5-6) and five (31.25%) were junior enlisted (E 1-4). The ARNG ORTHO referral average age was 36.8 years and their average length of stay was 19.3 days.

The USMC ORTHO referrals upon arrival at WRAMC consisted of two male soldiers, one of which was a junior non-commissioned officers (E 5-6) and the other a junior enlisted (E 1-4).

The USMC ORTHO referral average age was 27.5 years and their average length of stay was 10.0 days.

The ADAF ORTHO referrals upon arrival at WRAMC consisted of two male junior non-commissioned officers (E 5-6). Their average age was 29.50 years and their average length of stay was 37.0 days.

The one male AFNG ORTHO referral was a 45-old senior non-commissioned officer (E-7 and above) with a one-day length of stay.

The one Other ORTHO referral was a 43-old male with an 18-day length of stay.

Surgery Referrals

The overall SURG referrals had an average age of 27.1 years and an average length of stay of 16.8 days.

The Active Duty Army SURG referrals upon arrival at WRAMC consisted of 78 soldiers, one of which was female (see Table 6). A total of six (7.69%) were officers or warrant officers, five (6.41%) were senior non-commissioned officers (E-7 and above), 21 (26.92%) were junior non-commissioned officers (E 5-6) and 46 (58.97%) were junior enlisted (E 1-4).

The Active Duty Army SURG referral average age was 26.2 years and their average length of stay was 16.8 days.

The USAR SURG referrals consisted of five soldiers, one of which was a female. One (20.00%) was a senior non-commissioned officer (E-7 and above), one (20.00%) was a junior non-commissioned officer (E 5-6) and three (60.00%) were junior enlisted (E 1-4).

The USAR SURG referral average age was 28.6 years and their average length of stay was 15.8 days.

The ARNG SURG referrals consisted of seven male soldiers. A total of three (42.86%) were junior non-commissioned officers (E 5-6) and four (57.14%) were junior enlisted (E 1-4).

The ARNG SURG referral average age was 31.3 years and their average length of stay was 19.3 days.

The USMC SURG referrals consisted of one male junior enlisted (E 1-4) soldier. He was 20 years old and had a length of stay of 22 days.

The one USN SURG referral was a male civilian; he was 41 years old and had a two-day length of stay.

The Other SURG referral was a 53-year old male with a 13-day length of stay.

Medicine Referrals

The overall MED referrals had an average age of 30.6 years and an average length of stay of 17.8 days.

The Active Duty Army MED referrals upon arrival at WRAMC consisted of 46 soldiers, five of which were female (see Table 7). A total of six (13.04%) were officers or warrant officers, six (13.04%) were senior non-commissioned officers (E-7 and above), 16 (34.78%) were junior non-commissioned officers (E 5-6) and 18 (39.13%) were junior enlisted (E 1-4).

The Active Duty Army MED referral average age was 30.4 years and their average length of stay was 10.0 days.

The USAR MED referrals upon arrival at WRAMC consisted of 17 soldiers, one of which was female. A total of two (11.76%) were officers or warrant officers, one (5.88%) was a senior non-commissioned officer (E-7 and above), four (23.53%) were junior non-commissioned officers (E 5-6) and 10 (58.82%) were junior enlisted (E 1-4).

The USAR MED referral average age was 34.4 years and their average length of stay was 9.4 days.

The ARNG MED referrals consisted of 18 soldiers, one of which was female. A total of two (11.11%) were officers or warrant officers, 10 (55.56%) were junior non-commissioned officers (E 5-6) and six (33.33%) were junior enlisted (E 1-4).

The ARNG MED referral average age was 36.9 years and their average length of stay was 7.3 days.

The USMC MED referrals consisted of one male junior enlisted (E 1-4) Marine, who was 25 years old and had a three-day LOS.

The USN MED referrals consisted of three soldiers, one of which was female. One (33.33%) was an officer or warrant officer, one (33.33%) was a junior non-commissioned officer (E 5-6) and one (33.33%) was junior enlisted (E 1-4).

The USN MED referral average age was 27.7 years and their average length of stay was 30.7 days.

The ADAF MED referrals consisted of two male airmen. One was a senior non-commissioned officer (E-7 and above), and the other was a junior non-commissioned officer (E 5-6). Their average age was 39.5 years and their average length of stay was 13.0 days.

The AFNG MED referrals consisted of one 36-year old male junior non-commissioned officer (E 5-6) with a one-day length of stay.

The Other MED referrals upon arrival at WRAMC consisted of four males with an average age of 42.3 and an average length of stay of 28.0 days.

Psychology/Psychiatry Referrals

The overall PSYCH referrals had an average age of 28.5 years and an average length of stay of 13.8 days (see Table 8).

The AD Army PSYCH referrals consisted of 38 soldiers, six of which were female. A total of two (5.26%) were officers or warrant officers, four (10.53%) were senior non-commissioned officers (E-7 and above), eight (21.05%) were junior non-commissioned officers (E 5-6) and 24 (63.16%) were junior enlisted (E 1-4).

The AD Army PSYCH referral average age was 26.8 years and their average length of stay was 13.7 days.

The USAR PSYCH referrals consisted of 12 soldiers, five of which were female. Two (16.67%) were senior non-commissioned

officers (E-7 and above), two (16.67%) were junior non-commissioned officers (E 5-6) and eight (66.67%) were junior enlisted (E 1-4).

The USAR PSYCH referral average age was 33.4 years and their average length of stay was 18.7 days.

The ARNG PSYCH referrals consisted of 10 soldiers, four of which were female. One (10.00%) was an officer or warrant officer, one (10.00%) was a junior non-commissioned officer (E 5-6) and eight (80.00%) were junior enlisted (E 1-4).

The ARNG PSYCH referral average age was 30.6 years and their average length of stay was 8.6 days.

The USMC PSYCH referral was a 36-old male officer or warrant officer with a two-day LOS.

The USN PSYCH referrals consisted of three male sailors. One (33.33%) was a junior non-commissioned officer (E 5-6) and two (66.67%) were junior enlisted (E 1-4). Their average age was 27.67 years and their average length of stay was 21.67 days.

The ADAF PSYCH referrals consisted of four male soldiers. One (25.00%) was a junior non-commissioned officer (E 5-6) and three (75.00%) were junior enlisted (E 1-4).

The ADAF PSYCH referral average age was 24.3 years and their average length of stay was 8.5 days.

Ophthalmology Referrals

The overall Ophthalmology (OPHTH) referrals had an average age of 27.4 years and an average length of stay of 20.4 days (see Table 9).

The AD Army OPHTH referrals consisted of seven male soldiers. Four (57.14%) were junior non-commissioned officers (E 5-6) and three (42.86%) were junior enlisted (E 1-4). The AD Army OPHTH referral average age was 26.1 years and their average length of stay was 22.7 days.

The ARNG OPHTH referral consisted of a 44-year-old female junior enlisted (E 1-4) soldier with an 11-day LOS.

The ADAF OPHTH referral consisted of a 20-year-old male junior enlisted (E 1-4) soldier with a 14-day LOS.

Obstetrics-Gynecology Referrals

The overall Obstetrics-Gynecology (OBGYN) referrals had an average age of 32.50 years and an average length of stay of 13.50 days (see Table 10).

The sole AD Army OBGYN referral was a 35-year-old female junior non-commissioned officer (E 5-6) with a 13-day length of stay.

The ADAF OBGYN referral was a 30-year-old female senior non-commissioned officer (E 7-8) with a four-day length of stay.

Cost

The overall average DRG cost for the patients in this study was \$21,224.53, with an n of 280 patients with available cost

data. On average, male patients were more expensive to treat, with an average cost of \$21,497.161, a standard deviation of \$27,803.36 and a range from \$2,561.73 to \$212,935.34 (n = 257). The female average cost was \$18,683.97, only 66% of the average cost to treat male soldiers. The female average cost had an n of 23, a standard deviation of \$15,769.81 and a range between \$2,815.10 - \$57,769.31 (see Table 11). This difference in gender is likely attributable to the restriction of female service members from serving in certain combat specialties, exposing male soldiers to a greater number of blast injuries and gun shot wounds, which generally require a more expensive treatment regime.

The most expensive service members to treat in this study were junior non-commissioned officers (E5 - E6), with an average cost per patient of \$24,732.30, with an n of 92, a standard deviation of \$33,123.13 and a range of \$4,024.84 - \$212,935.34 (the greatest cost range of all ranks in the study). The E5 - E6 average was slightly larger than that of junior enlisted soldiers (E1 - E4), which was \$21,502.38. This E1 - E4 group had an n of 137, a standard deviation (SD) of \$26,102.56 and a range of \$2,561.73 - \$191,659.56 (the second largest range). This finding reflects the reality that, in the initial phase of the fighting in Iraq, junior service members in these two groups were more likely to engage enemies in direct action, exposing

themselves to a greater number of potential injuries than their senior-ranking fellow service members. What is striking, however, is that the difference between the ranks were not as dramatically as one might expect. Although the senior NCOs (E7 - E9) are, by nature, older than the other ranks (average of 42 years), their average cost was only \$16,772.62, with an n of 23, a SD of \$12,050.43 and a range from \$4,222.13 - \$40,918.15. This is perhaps due to the medical screening requirements prior to deploying and the fact that only 32% of their numbers received Battle Injuries, compared to 34% for junior non-commissioned officers and 41% for junior enlisted.

When analyzed by DNBI, the Non-Battle Injury patients proved most expensive (\$24,160.12), with BI patients a close second (\$22,581.76) and patients evacuated to WRAMC for Diseases a distant third with a \$13,442.46 average cost (see Table 13).

Those GWOT patients referred to WRAMC's Ophthalmology service cost an average of \$31,212.88, ORTHO patients cost an average of \$29,142.98, SURG patients \$22,626.37, Medicine patients an average of \$1975.65, OBGYN referrals an average of \$15,589.62 and PSYCH patients costing an average of \$5,705.62 (see Table 14).

Discussion

The United States military is currently engaged in a Global War on Terrorism that has forced all the armed service to

redefine the role that they will play in this and future conflicts. Contingency operations may require commitment of U.S. soldiers in other parts of the world such as Central America, South America, or Asia and the Pacific Rim. U.S. Army Medical Centers may find themselves receiving wartime casualties that overwhelm their resources, requiring flexibility and innovation. While the continued technological dominance in war allows the US to avoid unnecessary exposure to the traditional dangers of conflict, the nation-building and occupation that follow have forced soldiers to face an amorphous and asymmetrical threat that can strike unexpectedly, irrespective of rank and gender. The Army's new Chief of Staff, General Peter J. Schoomaker, has identified this trend. He recently stated, "On the battlefields we face, there are no front lines and rear areas. The rear is often the front, and there are no 'secure' garrisons or convoys" (The United State Army Web Site).

With this in mind, the Army Medical Department must also recognize this trend and refocus their efforts to address the medical needs of the transformation. Healthcare administrators and resource managers at Walter Reed and other major Army Medical Centers can use this information to help anticipate changes in resource expenditures when supporting the treatment of military casualties from future contingency operations such as the Global War on Terrorism.

The longer WRAMC LOS of Battle Injuries indicated the complexity and sustained effort required to care for battle injury soldiers and the corresponding outlay of medical resources required to meet this substantial medical need of soldiers recovering from injuries. Also of note is WRAMC experiencing longer stays than both LRMC and the DOJ reports. The longer WRAMC LOS is indicative of the need for definitive tertiary and rehabilitative care for casualties evacuated to CONUS. With those facts in mind, it is also important to acknowledge a growing trend in facilitating family members' visitation of their recovering service members at WRAMC. Walter Reed has seen a significant increase in the number of family members arriving for prolonged periods while their service member is on an inpatient status. WRAMC has also noted a marked increase in the family's expectation of Army services and their willingness to voice issues to the media or their Congressional representatives. This trend has caused WRAMC to establish a fully staffed Medical Family Assistance Center (MEDFAC) to help families and soldiers access all the Army services they might need while receiving care at Walter Reed. In addition, there are indications that WRAMC is experiencing declines in TRICARE Prime enrollee inpatient services, which are unavailable due to recovering GWOT soldiers. There may be long-term affects felt in the Prime patients while the OIF enters a second year.

Conclusions & Recommendations

The Global War on Terror is a broad and varied combination of contingency operations that will likely define the Department of Defense's focus in the foreseeable future. As a result, lessons learned by AMEDD leaders through experiences in treating wartime casualties should be analyzed to ensure greater preparedness in the future. Walter Reed's role in the comprehensive treatment and rehabilitation of GWOT evacuees should serve as a model for DOD medical centers who may find themselves supporting contingency operations as a primary referral center for patients evacuated from overseas. Potential theoretical examples include Tripler or Madigan Army Medical Centers supporting contingency operations in the Asia and Pacific Rim or Brooke Army Medical Center in support of operations in Central and South America. Examples could also include U. S. Air Force and Navy medical centers or Veterans' Administration facilities serving in a similar capacity.

Walter Reed, as mentioned above, has already realigned resources to meet the medical need of GWOT patients, but a greater understanding of the patient population being seen will allow decision-makers to better anticipate trends and possible future needs. The current method of projecting GWOT inpatient DRG costs at WRAMC should incorporate this study's breakout average costs of referral services (SURG, MED, ORTHO, OPHTH,

PSYCH and OBGYN) in their calculations to more accurately determine what the likely coded costs will be. For example, an admitted Psychiatric inpatient would be estimated to cost \$5,705.62 until that patient was discharged and properly coded, often several weeks later.

AMEDD leaders at potential CONUS-based contingency support hospitals can better prepare their resources in advance of casualties to better meet the increased demand for certain services. Preparing military backfill requests and personnel service contracts in anticipation of expected specialty shortages such as surgeons, orthopedic surgeons, anesthesia nurses and administrative support will help meet the medical need closer to the initial wave of casualties. Planners must also recognize those unique services required for redeploying soldiers and their visiting family members, such as family assistance centers, benefits advisors and social workers. Planners must anticipate an influx in military family members and relatives arriving with little or no notice for extended visits to support the injured service member.

The results of this study may also guide resource managers in recapturing expenditures used in contingency operations for which the OMB provides additional emergency funding above and beyond programmed budgets. WRAMC is currently in the process of refining their method of dividing the reimbursed funding amongst

the departments that participated in the care and recovery of the inpatient soldiers. The proposed method includes a distribution amongst the following departments based on their estimated contribution: Surgery 30%, Medicine 20%, Nursing 20%, Orthopedics 10%, Psychiatry 5%, Neurology 5 %, Laboratory 5% and Radiology 5%. This distribution will allow a proportional reimbursement of GWOT expenditures that closely reflects their expenditures. This interim plan should be analyzed and adjusted as needed until a more detailed inpatient costing system is adopted by the AMEDD. At the time of this study, the Office of the Army's Surgeon General Uniform Business Office is planning the implementation of an automated Inpatient Itemized Billing (IIB) system to better capture the exact contribution of various services to an inpatient encounter. This system will be incorporated into the calculation of GWOT inpatient costs and should, to the extent possible, be used to more accurately project reimbursement costs for those admitted GWOT inpatients that have not yet been discharged and properly coded.

The methodology of this study should be repeated for WRAMC's FY 2004 GWOT casualties to determine if there are differences in the overall composition of casualties with the changing nature of the supported operations.

Table 1

Number of Patients by Patient Category and Armed Service Component

Armed Service Component	Patient Category			Total
	Battle Injury	Disease	Non- Battle Injury	
AD Army	118	47	77	242
USAR	9	22	17	48
ARNG	9	18	25	52
USMC	4	0	1	5
USN	1	4	2	7
ADAF	1	2	7	10
AFNG	1	0	1	2
Other	2	3	1	6
Total	145	96	131	372

Note. AD Army = Active Duty Army. ARNG = Army National Guard.
USMC = Marine Corps. USN = Navy. ADAF = Active Duty Air Force.
AFNG = Air Force National Guard.

Table 2

Number of Battle Injury Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	117	1	16	6	36	60	0	18.0	26.9
USAR	8	1	0	2	2	5	0	16.8	28.4
ARNG	8	1	1	1	1	5	0	19.4	34.1
USMC	4	0	1	0	1	2	0	11.0	27.8
USN	1	0	0	0	0	0	1	2.0	41.0
ADAF	1	0	0	0	0	1	0	14.0	20.0
AFNG	1	0	0	1	0	0	0	1.0	45.0
Other	2	0	0	0	0	0	2	1.0	41.5
Total	142	3	18	10	40	73	2	17.9	27.9

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 3

Number of Disease Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	39	8	3	6	12	26	0	12.7	29.1
USAR	18	4	1	1	5	15	0	13.3	31.2
ARNG	14	4	2	0	6	10	0	6.3	35.6
USMC	0	0	0	0	0	0	0	30.3	30.8
USN	4	0	1	0	2	1	0	13.3	33.5
ADAF	2	0	0	1	0	1	0	14.0	32.5
AFNG	0	0	0	0	0	0	0	0.0	0.0
Other	3	0	0	0	0	0	3	17.0	46.3
Total	80	16	7	8	25	53	3	12.5	31.3

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 4

Number of Non-Battle Injury Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	67	10	8	8	28	33	0	14.0	28.81
USAR	15	2	1	4	5	7	0	11.5	39.2
ARNG	23	2	1	1	15	8	0	15.2	34.9
USMC	1	0	0	0	0	1	0	3.0	25.0
USN	1	1	0	0	0	2	0	18.0	21.5
ADAF	6	1	0	0	4	3	0	15.7	28.6
AFNG	0	1	0	0	1	0	0	1.0	36.0
Other	1	0	0	0	0	0	1	18.0	43.0
Total	114	17	10	13	53	54	1	13.8	31.0

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 5

Number of Orthopedics Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	66	6	12	5	26	29	0	18.6	28.67
USAR	13	1	0	5	3	6	0	11.4	32.1
ARNG	15	1	1	1	9	5	0	19.3	36.8
USMC	2	0	0	0	1	1	0	10.0	27.5
USN	0	0	0	0	0	0	0	0.0	0.0
ADAF	2	0	0	0	2	0	0	37.0	29.5
AFNG	1	0	0	1	0	0	0	1.0	45.0
Other	1	0	0	0	0	0	1	18.0	43.0
Total	100	8	13	12	41	41	1	17.8	30.6

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 6

Number of Surgery Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	77	1	6	5	21	46	0	16.8	26.2
USAR	4	1	0	1	1	3	0	15.8	28.6
ARNG	7	0	0	0	3	4	0	19.3	31.3
USMC	1	0	0	0	0	0	1	2.0	41.0
USN	0	0	0	0	0	2	0	18.0	21.5
ADAF	0	0	0	0	0	0	0	0.0	0.0
AFNG	0	0	0	0	0	0	0	0.0	0.0
Other	1	0	0	0	0	0	1	13.0	53.0
Total	91	2	6	6	25	55	1	16.8	27.1

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 7

Number of Medicine Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	41	5	6	6	16	18	0	10.0	30.4
USAR	16	1	2	1	4	10	0	9.4	34.4
ARNG	17	1	2	0	10	6	0	7.3	36.9
USMC	1	0	0	0	0	1	0	3.0	25.0
USN	2	1	1	0	1	1	0	30.7	27.7
ADAF	2	0	0	1	1	0	0	13.0	39.5
AFNG	1	0	0	0	1	0	0	1.0	36.0
Other	4	0	0	0	0	0	4	28.0	42.3
Total	84	8	11	8	33	36	4	10.7	33.0

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 8

Number of Psychology/Psychiatry Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	32	6	2	4	8	24	0	13.7	26.8
USAR	7	5	0	2	2	8	0	18.7	33.4
ARNG	6	4	1	0	1	8	0	8.6	30.6
USMC	1	0	1	0	0	0	0	2.0	36.0
USN	3	0	0	0	1	2	0	21.7	27.7
ADAF	4	0	0	0	1	3	0	8.5	24.3
AFNG	0	0	0	0	0	0	0	0.0	0.0
Other	0	0	0	0	0	0	0	0.0	0.0
Total	53	18	4	6	13	45	0	13.8	28.5

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 9

Number of Ophthalmology Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	7	0	0	0	4	3	0	22.7	26.1
USAR	0	0	0	0	0	0	0	0.0	0.0
ARNG	0	1	0	0	0	1	0	11.0	44.0
USMC	0	0	0	0	0	0	0	0.0	0.0
USN	0	0	0	0	0	0	0	0.0	0.0
ADAF	0	0	0	0	0	0	0	0.0	0.0
AFNG	1	0	0	0	0	1	0	14.0	20.0
Other	0	0	0	0	0	0	0	0.0	0.0
Total	8	1	0	0	4	5	0	20.4	27.4

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 10

Number of Obstetrics/Gynecology Patients by Gender, Rank & Component

Armed Service Component	Gender		Rank					Avg. LOS	Avg. Age
	Male	Female	WO1	E7	E5	E4	Other		
			- O6	- E9	- E6	- E1			
AD Army	0	1	0	0	1	0	0	17.0	35.0
USAR	0	0	0	0	0	0	0	0.0	0.0
ARNG	0	0	0	0	0	0	0	0.0	0.0
USMC	0	0	0	0	0	0	0	0.0	0.0
USN	0	0	0	0	0	0	0	0.0	0.0
ADAF	0	1	0	0	1	0	0	4.0	30.0
AFNG	0	0	0	0	0	0	0	0.0	0.0
Other	0	0	0	0	0	0	0	0.0	0.0
Total	0	2	0	0	2	0	0	10.5	32.5

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

LOS = Length of Stay (in days) as an inpatient at Walter Reed.

Table 11

Average Cost by Gender

<u>Gender</u>	<u>AVG Cost/</u> <u>Patient</u>	<u>n</u>	<u>Standard</u> <u>Deviation</u>	<u>Range</u>
Male	\$21,497.16	257	\$27,803.36	\$2,561.73 - \$212,935.34
Female	\$18,683.97	23	\$15,769.81	\$2,815.10 - \$57,769.31

Note. n = 280 (number of patients with available cost data).

Table 12

Average Cost by Rank

<u>Rank</u>	<u>AVG Cost/</u> <u>Patient</u>	<u>n</u>	<u>Standard</u> <u>Deviation</u>	<u>Range</u>
WO1 - O6	\$18,874.86	23	\$15,322.22	\$5,417.33 - \$52,962.55
E7 - E9	\$16,772.62	23	\$12,050.43	\$4,222.13 - \$40,918.15
E5 - E6	\$24,732.30	92	\$33,123.13	\$4,024.84 - \$212,935.34
E1 - E4	\$21,502.38	137	\$26,102.56	\$2,561.73 - \$191,659.56
Other	\$17,650.93	5	\$13,822.74	\$6,195.09 - \$34,389.73

Note. WO1-O6 = Military Officers. E7-E9 = Senior Non-commissioned Officers.

E5-E6 = Junior Non-commissioned Officers. E4-E1 = Enlisted Soldiers.

n = 280 (number of patients with available cost data).

Table 13

Average Cost Per Patient by Patient Category

Patient	AVG Cost/	<u>n</u>	<u>Standard</u>	<u>Range</u>
<u>Category</u>	<u>Patient</u>		<u>Deviation</u>	
NBI	\$24,160.12	109	\$35,044.56	\$6,275.05 - \$212,935.34
BI	\$22,581.76	106	\$13,593.35	\$4,896.06 - \$191,659.56
D	\$13,442.46	65	\$16,034.29	\$2,815.10 - \$87,585.92

Note. NBI = Non-battle injury. BI = Battle Injury. D = Disease. n = 280 (number of patients with available cost data).

Table 14

Average Cost Per Patient by Referral

<u>Referral</u>	<u>AVG Cost/</u>	<u>n</u>	<u>Standard</u>	<u>Range</u>
<u>Service</u>	<u>Patient</u>		<u>Deviation</u>	
OPHTH	\$31,212.88	7	\$44,367.13	\$6,216.90 - \$130,041.95
ORTHO	\$29,142.98	82	\$36,073.30	\$4,649.96 - \$212,935.34
SURG	\$22,626.37	74	\$25,632.55	\$6,195.09 - \$191,659.56
MED	\$19,175.65	69	\$17,519.32	\$4,802.60 - \$72,758.61
OBGYN	\$15,589.62	1	N/A	\$15,589.62 - \$15,589.62
PSYCH	\$ 5,705.62	47	\$2,130.17	\$2,561.73 - \$13,882.37

Note. OPTHO = Ophthalmology. ORTHO = Orthopedics. SURG = Surgery. MED = Medicine.
 OBGYN - Obstetrics & Gynecology. PSYCH = Psychology & Psychiatry. n = number of
 patients with available cost data

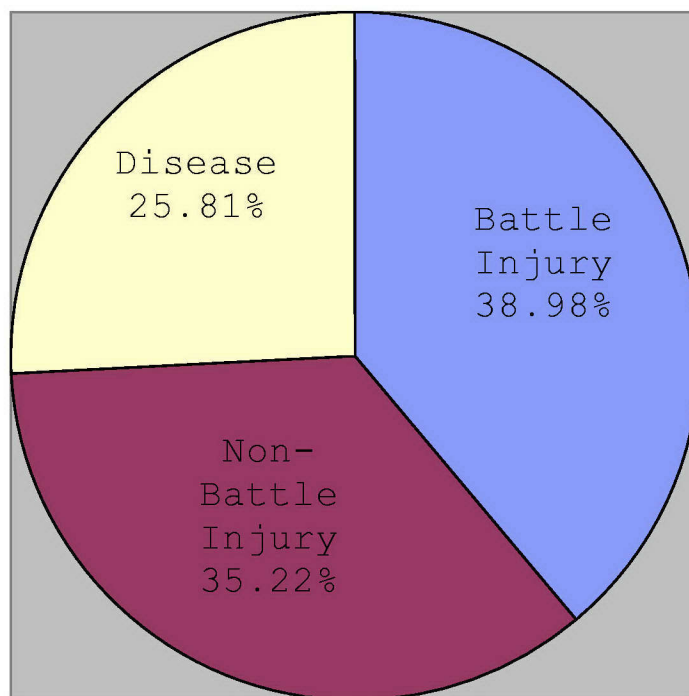


Figure 1. *Type of Injury*

n=372

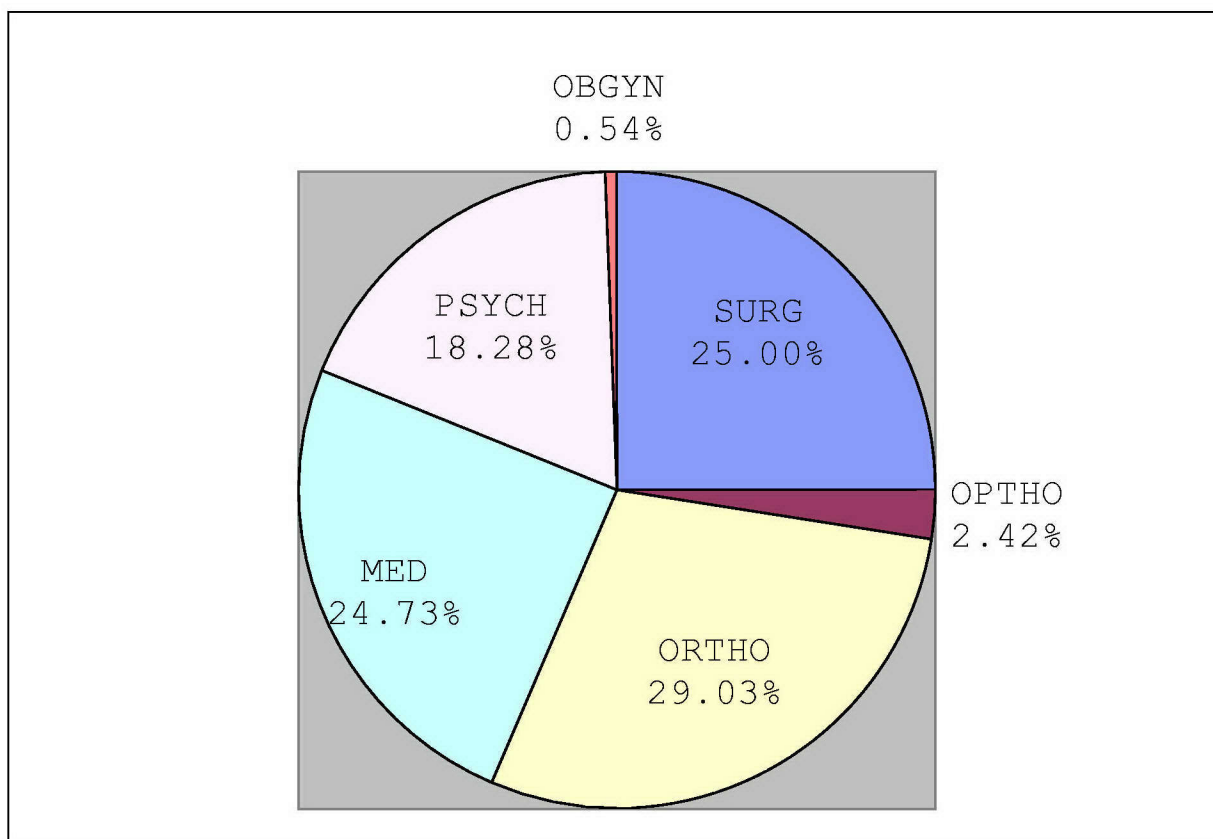


Figure 2. *Primary Referral Service*

n=372

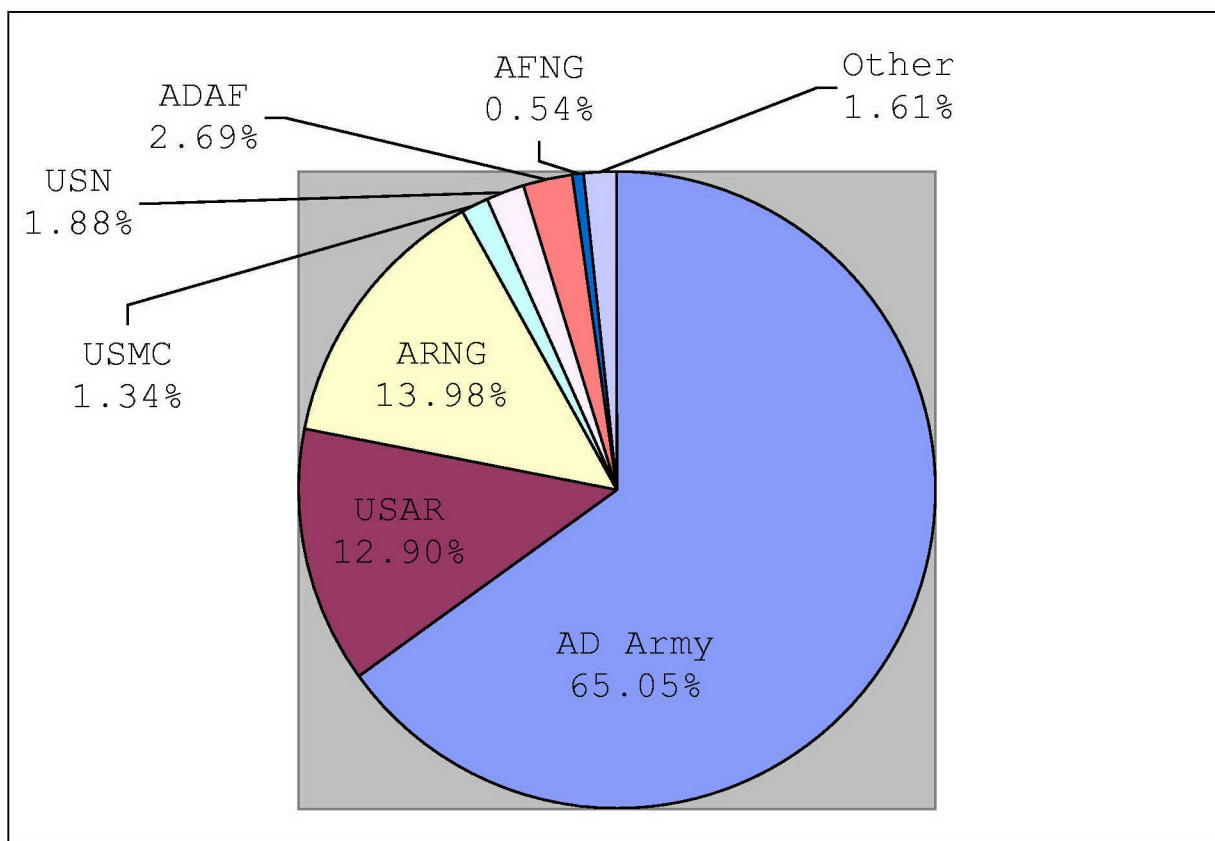


Figure 3. *Armed Service Component*

n=372

Definitions

ACTIVE DUTY. Full-time duty in the active military service of the United States. It includes federal duty of the active list (for National Guard personnel), full-time training duty, annual training, and attendance while in the active military service at a school designated as a service school by law or the Secretary of the Military Department concerned. As it relates to medical care, the term Active Duty does not include Active Duty for Training. (<http://www.tricare.osd.mil/imtr/glossary/html>)

BATTLE INJURY. Any casualty (death, wound, missing, capture, or internment) provided such loss is incurred in action. "In action" characterizes the casualty status as having been the direct result of hostile action; sustained in combat and related thereto; or sustained going to or returning from a combat mission provided that the occurrence was directly related to hostile action. Included are persons killed or wounded mistakenly or accidentally by friendly fire directed at a hostile force or what is thought to be a hostile force. However, not to be considered as sustained in action and thereby not to be interpreted as battle casualties are injuries due to the elements, self-inflicted wounds, and, except in unusual cases, wounds or death inflicted by a friendly force while the individual is in absent-without-leave or dropped-from-rolls

status or is voluntarily absent from a place of duty.

(<http://www.tricare.osd.mil/imtr/glossary/html>)

CASUALTY. Any person who is lost to the organization by reason of having been declared dead, wounded, injured, diseased, interned, captured, retained, missing, missing in action, beleaguered, besieged or detained.

(<http://www.tricare.osd.mil/imtr/glossary/html>)

DIAGNOSIS-RELATED GROUP (DRG). Patient classification system that relates demographic, diagnostic, and therapeutic characteristics of patients to length of inpatient stay and amount of resources consumed. It provides a framework for specifying hospital case mix and identifies classifications of illnesses and injuries for which payment is made under prospective pricing programs.

(<http://www.tricare.osd.mil/imtr/glossary/html>)

DISEASE NON-BATTLE INJURY (DNBI). An accident or injury that is not the direct result of hostile action by or against an organized enemy. This includes injuries due to the elements, self-inflicted wounds, and in most cases, wounds or death inflicted by a friendly force while the individual is absent without leave or in a dropped-from-rolls status or is voluntarily absent from a place of duty. It includes all injuries during peacetime.

(<http://www.tricare.osd.mil/imtr/glossary/html>)

NON-BATTLE CASUALTY. A person who is not a battle casualty, but who is lost to his organization by reason of disease or injury, including persons dying from disease or injury, or by reason of being missing where the absence does not appear to be voluntary or due to enemy action or to being interned.

(<http://www.tricare.osd.mil/imtr/glossary/html>)

OPERATION ENDURING FREEDOM (OEF). Represents all missions that support the GWOT outside continental United States (OCONUS), with exception of OIF. Execution of tasks in support of these missions may occur in the continental United States (CONUS) or OCONUS. The specific area of operations supported by the contingency operation identifies the OEF mission such as OEF-A (Afghanistan), OEF-P (Philippines), and OEF-HOA (Horn of Africa). Training the Afghanistan National Army is a mission which falls under OEF-A as does detainee operations executed primarily at station Guantanamo, Cuba. (USAMEDCOM, 2004)

OPERATION IRAQI FREEDOM (OIF). Represents all missions that support the GWOT within Iraq. Execution of tasks in support of these missions may occur in CONUS or OCONUS. (USAMEDCOM, 2004)

REFERRAL. Practice of sending a patient to another program or practitioner for services or advice that the referring source is not prepared or qualified to provide.

(<http://www.tricare.osd.mil/imtr/glossary/html>)

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